# Complete Summary

## GUIDELINE TITLE

Age-related macular degeneration. Limited revision.

## BIBLIOGRAPHIC SOURCE(S)

American Academy of Ophthalmology (AAO). Age-related macular degenration. Preferred practice pattern. San Francisco (CA): American Academy of Ophthalmology (AAO); 2006. 33 p. [134 references]

## GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Retina Panel, Preferred Practice Patterns Committee. Age-related macular degeneration. San Francisco (CA): American Academy of Ophthalmology (AAO); 2005. 30 p.

All Preferred Practice Patterns are reviewed by their parent panel annually or earlier if developments warrant and updated accordingly. To ensure that all Preferred Practice Patterns are current, each is valid for 5 years from the "approved by" date unless superseded by a revision.

## ** REGULATORY ALERT **

## FDA WARNING/REGULATORY ALERT

**Note from the National Guideline Clearinghouse**: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- March 6, 2006, Macugen (pegaptanib sodium injection): Product labeling changes to the CONTRAINDICATIONS, PRECAUTIONS, ADVERSE EVENTS Post-Marketing, and DOSAGE and ADMINISTRATION sections due to rare reports of anaphylaxis/anaphylactoid reactions, including angioedema.

## COMPLETE SUMMARY CONTENT

## SCOPE

### DISEASE/CONDITION(S)

Age-related macular degeneration

### GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Treatment

### CLINICAL SPECIALTY

Ophthalmology

### INTENDED USERS

Health Plans
Physicians

### GUIDELINE OBJECTIVE(S)

To minimize loss of vision and to maximize the vision-related quality of life related to age-related macular degeneration (AMD), by addressing the following goals:

- Identify patients at risk of visual loss related to age-related macular degeneration
- Educate patients and their families about the disease, risk factors, and preventive measures
- Minimize visual loss and functional impairment in these patients through appropriate detection, treatment, and follow-up examinations
- Help patients identify sources for visual rehabilitation

### TARGET POPULATION

Persons typically age 50 years or older, with or without visual symptoms

### INTERVENTIONS AND PRACTICES CONSIDERED

#### Diagnosis/Evaluation

1. History, including history of symptoms, medications and nutritional supplements, medical and ocular history, family history (especially of age-related macular degeneration [AMD]), social history (especially smoking)
2. Stereo biomicroscopic examination of the macula
3. Diagnostic tests, including fluorescein angiography and/or fundus photography when indicated.

**Note**: Indocyanine green (ICG) video-angiography and optical coherence tomography (OCT) were discussed but not specifically recommended.

### Treatment/Management

1. Observation with no medical or surgical therapies
2. Antioxidant vitamin and mineral supplements
3. Thermal laser photocoagulation surgery
4. Photodynamic therapy (PDT) with verteporfin
5. Pegaptanib sodium intravitreal injection
6. Ranibizumab intravitreal injection
7. Bevacizumab intravitreal injection
8. Follow-up after treatment for neovascular AMD
9. Fundus photography and fluorescein angiography, when indicated
10. Patient and family education
11. Referral to vision rehabilitation and social services

## MAJOR OUTCOMES CONSIDERED

- Incidence of severe vision loss and functional impairment due to age-related macular degeneration
- Risks, benefits and complications of treatment

# METHODOLOGY

## METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

## DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

In the process of revising this document, a detailed literature search of articles in the English language was conducted on the subject of age-related macular degeneration for the years 1997 to 2002.

In 2005, the Preferred Practice Pattern (PPP) was revised to include recommendations for treatment with intravitreal injection of pegaptanib sodium, an angiogenic inhibitor approved by the U.S. Food and Drug Administration (FDA) in December 2004. In 2006, the PPP was revised to include recommendations for treatment with intravitreal injection of additional angiogenic inhibitors.

## NUMBER OF SOURCE DOCUMENTS

Not stated

## METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

## RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

- Level I includes evidence obtained from at least one properly conducted, well-designed randomized, controlled trial. It could include meta-analyses of randomized controlled trials.
- Level II includes evidence obtained from the following:
    - Well-designed controlled trials without randomization
    - Well-designed cohort or case-control analytic studies, preferably from more than one center
    - Multiple-time series with or without the intervention
- Level III includes evidence obtained from one of the following:
    - Descriptive studies
    - Case reports
    - Reports of expert committees/organizations (e.g., Preferred Practice Pattern (PPP) panel consensus with peer review)

## METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

## DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

## METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The results of the literature search on the subject of age-related macular degeneration were reviewed by the Retina Panel and used to prepare the recommendations, which they rated in two ways. The panel first rated each recommendation according to its importance to the care process. This "importance to the care process" rating represents care that the panel thought would improve the quality of the patient's care in a meaningful way. The panel also rated each recommendation on the strength of the evidence in the available literature to support the recommendation made.

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

### Ratings of Importance to Care Process

Level A, defined as most important
Level B, defined as moderately important
Level C, defined as relevant but not critical

### COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

### METHOD OF GUIDELINE VALIDATION

Internal Peer Review

### DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

These guidelines were reviewed by Council and approved by the Board of Trustees of the American Academy of Ophthalmology (September 2006).

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

Ratings of importance to the care process (A-C) and ratings of strength of evidence (I-III) are defined at the end of the "Major Recommendations" field.

#### Diagnosis

The initial evaluation of a patient with signs and symptoms suggestive of age-related macular degeneration (AMD) includes all features of the comprehensive adult medical eye evaluation, with particular attention to those aspects relevant to AMD.

#### History

- Symptoms [A:II]
    - Metamorphopsia
    - Decreased vision
- Medications and nutritional supplements [B:III]
- Medical and ocular history [B:II]
- Family history, especially family history of AMD [B:II]
- Social history, especially smoking [B:II]

#### Examination

- Stereo biomicroscopic examination of the macula [A:III]

#### Diagnostic Tests

Intravenous fundus fluorescein angiography in the clinical setting of AMD is indicated [A:I] when the patient complains of new metamorphopsia or has

unexplained blurred vision, and/or when clinical examination reveals elevation of the retinal pigment epithelium (RPE) or retina, subretinal blood, hard exudates, or subretinal fibrosis and in the following situations:

- To detect the presence of and determine the extent, type, size, and location of choroidal neovascularization (CNV) and to calculate the percentage of the lesion composed of or consisting of classic CNV. If laser photocoagulation surgery or verteporfin photodynamic therapy (PDT) is being considered, the angiogram is also used as a guide to direct treatment.
- To detect persistent or recurrent CNV following treatment
- To assist in determining the cause of visual loss that is not explained by the clinical examination.

If CNV is suspected on the basis of new symptoms or ocular findings, fluorescein angiography should be performed and interpreted expeditiously by an individual experienced in managing patients with neovascular AMD. [A:I]

Each angiographic facility should have in place a care plan or an emergency plan and a clear protocol to minimize the risks and to manage any complications. [A:III]

**Treatment**

Because there are observational data that support a causal relationship between smoking and AMD (Khan et al, 2006; Seddon, George & Rosner, 2006; Thorton et al, 2005) [A:II] and other considerable health benefits of smoking cessation, patients who are currently smoking should be advised to stop [A:III]. Studies have found that smokers report that a physician's advice to quit is an important motivator in attempting to stop smoking. (National Cancer Institute, 1994; Ockene, 1987; Pederson, Baskerville & Wanklin, 1982)

Assessment and treatment plans for different categories of AMD are listed in the table below.

| Recommended Treatment | Diagnoses Eligible for Treatment | Follow-up Recommendations |
|---|---|---|
| Observation with no medical or surgical therapies (Klein et al, 1997; Age-Related Eye Disease Study Research Group, 2001; Smiddy & Fine, 1984; Strahlman, Fine & Hillis, 1983; "Argon laser photocoagulation," 1993 [A:I]) | No clinical signs of AMD (Age-Related Eye Disease Study [AREDS] category 1) | As recommended in the Comprehensive Adult Medical Eye Evaluation Preferred Practice Pattern (PPP) (Preferred Practice Pattern Committee, 2005) [A:III] |
| | Early AMD (AREDS category 2) | Return exam at 6 to 24 months if asymptomatic or prompt exam for new symptoms suggestive of CNV [A:III] |
| | Advanced AMD with bilateral subfoveal geographic atrophy or | Return exam at 6 to 24 months if asymptomatic or prompt exam for new |

| Recommended Treatment | Diagnoses Eligible for Treatment | Follow-up Recommendations |
|---|---|---|
| | disciform scars | symptoms suggestive of CNV [A:III] |
| | | No fundus photos or fluorescein angiography unless symptomatic (AREDS, 2001 [A:I]) |
| Antioxidant vitamin and mineral supplements as recommended in the AREDS reports (Age-Related Eye Disease Study Research Group, 2001) [A:I] | Intermediate AMD (AREDS category 3)<br><br>Advanced AMD in one eye (AREDS category 4) | Monitoring of monocular near vision (reading/Amsler grid) [A:III] |
| | | Return exam at 6 to 24 months if asymptomatic or prompt exam for new symptoms suggestive of CNV [A:III] |
| | | Fundus photography as appropriate |
| | | Fluorescein angiography if there is evidence of edema or other signs and symptoms of CNV |
| Thermal laser photocoagulation surgery as recommended in the Macular Photocoagulation Study (MPS) reports ("Argon laser," 1991; "Five-year follow-up," 1993; "Laser photocoagulation," 1994 [MPSG reports]) [A:I] | Extrafoveal classic CNV, new or recurrent<br><br>Juxtafoveal classic CNV<br><br>May be considered, although rarely used, for new or recurrent subfoveal CNV if the lesion is less than 2 MPS disc areas and the vision is 20/125 or worse, especially if PDT is contraindicated or not available<br><br>May be considered for juxtapapillary CNV | Return exam with fluorescein angiography approximately 2 to 4 weeks after treatment, and then at 4 to 6 weeks and thereafter depending on the clinical and angiographic findings [A:III]<br><br>Retreatments as indicated<br><br>Monitoring of monocular near vision (reading/Amsler grid) [A:III] |
| PDT with verteporfin as recommended in the Treatment of Age-Related Macular Degeneration with Photodynamic Therapy (TAP) and Verteporfin in Photodynamic Therapy (VIP) reports ("Photodynamic therapy," 1999; Bressler, 2001; Verteporfin in Photodynamic Therapy | Subfoveal CNV, new or recurrent, where the classic component is >50% of the lesion and the entire lesion is $\leq$5400 microns in greatest linear diameter<br><br>Occult CNV may be considered for PDT with vision <20/50 or if the CNV is <4 MPS disc areas in size when the vision is >20/50. | Return exam approximately every 3 months until stable, with retreatments as indicated [A:III]<br><br>Fluorescein angiography or other imaging as indicated<br><br>Monitoring of monocular near vision (reading/Amsler grid) [A:III] |

| Recommended Treatment | Diagnoses Eligible for Treatment | Follow-up Recommendations |
|---|---|---|
| Study Group, 2001; Barbazetto et al, 2003) [A:I] | | |
| Pegaptanib sodium 0.3 milligrams intravitreal injection as recommended in pegaptanib sodium literature (U.S. Federal Drug Administration [FDA], Pegaptanib, 2006; Gragoudas et al., 2004) [A:I] | Subfoveal CNV, new or recurrent, for predominantly classic lesions ≤12 MPS disc areas in size<br><br>Minimally classic, or occult with no classic lesions where the entire lesion is ≤12 disc areas in size, subretinal hemorrhage associated with CNV comprises ≤50% of lesion, and/or there is lipid present, and/or the patient has lost 15 or more letters of visual acuity during the previous 12 weeks | Patients should be instructed to report any symptoms suggestive of endophthalmitis without delay, including eye pain or increased discomfort, worsening eye redness, blurred or decreased vision, increased sensitivity to light, or increased number of floaters [A:III]<br><br>Return exam with retreatments every 6 weeks as Indicated [A:III]<br><br>Monitoring of monocular near vision (reading/Amsler grid) [A:III] |
| Ranibizumab intravitreal injection 0.5 mg as recommended in ranibizumab literature (FDA, Ranibizumab, 2006) [A:I] | Subfoveal CNV | Patients should be instructed to report any symptoms suggestive of endophthalmitis without delay, including eye pain, or increased discomfort, worsening eye redness, blurred or decreased vision, increased sensitivity to light or increased number of floaters [A:III]<br><br>Return exam with retreatments every 4 weeks as indicated [A:III]<br><br>Monitoring of monocular near vision (reading/Amsler grid) [A:III] |
| Bevacizumab intravitreal injection as described in published reports (Avery et al, 2006; Maturi, Bleau & Wilson, 2006; Spaide et al, 2006; Bashshur et al, 2006; Rich et al, 2006) [A:III] | Subfoveal CNV | Patients should be instructed to report any symptoms suggestive of endophthalmitis without delay, including eye pain, or increased discomfort, worsening eye redness, blurred or decreased vision, increased sensitivity to light |

| Recommended Treatment | Diagnoses Eligible for Treatment | Follow-up Recommendations |
|---|---|---|
| The ophthalmologist should provide appropriate informed consent with respect to the of-label status (Ophthalmic Mutual Insurance Company [OMIC], 2006) [A:III] | | or increased number of floaters [A:III]<br><br>Return exam with retreatments every 4 to 8 weeks as indicated [A:III]<br><br>Monitoring of monocular near vision (reading/Amsler grid) [A:III] |

**Note**: If patients treated with thermal laser photocoagulation surgery, verteporfin PDT, or intravitreal injections notice visual loss or change prior to the next scheduled visit, return evaluation that may include angiography is recommended. [A:III]

The risks, benefits, and complications of the treatment should be discussed with the patient and informed consent obtained (see Counseling/Referral). [A:III]

Patients with CNV that meet the MPS criteria or with subfoveal CNV that meet TAP or VIP criteria for a predominantly classic lesion or an occult lesion with no classic CNV should be treated within 1 week after fluorescein angiography. [A:I]

**Follow-up**

A history and examination are the recommended elements of the follow-up visits. Recommended follow-up intervals are listed in the table above.

**History**

- Symptoms, including decreased vision and metamorphopsia [A:II]
- Changes in medications and nutritional supplements [B:III]
- Changes in medical and ocular history [B:III]
- Changes in social history (smoking) [B:II]

**Examination**

- Visual acuity [A:III]
- Stereo biomicroscopic examination of the fundus [A:III]

**Follow-up after Treatment for Neovascular AMD**

In addition to the above recommendations, patients who have been treated with thermal laser photocoagulation surgery, verteporfin photodynamic therapy (PDT), or pegaptanib sodium, ranibizumab, or bevacizumab injection should be examined at regular intervals by means of biomicroscopy of the fundus [A:III]. Fundus photography [A:III] and fluorescein angiography [A:I] should be employed when indicated.

A follow-up examination and fluorescein angiography should be performed approximately 2 to 4 weeks after initial thermal laser photocoagulation surgery to confirm that the CNV has been obliterated. [A:I] Subsequent examinations and fluorescein angiography should be performed at approximately 4 to 6 weeks and thereafter depending on the clinical findings and the judgment of the treating physician [A:I].

Following verteporfin PDT for subfoveal CNV, follow-up examinations may be recommended at approximately every 3 months until stable, with retreatments and fluorescein angiograms as indicated [A:III].

Following pegaptanib sodium injection, follow-up examinations should occur approximately 6 weeks following the treatment [A:III]. Patients treated with ranibizumab injection should have follow-up examinations approximately 4 weeks following the treatment [A:III]. Patients treated with bevacizumab injection should have follow-up examinations approximately four to eight weeks following the treatment. [A:III] Subsequent examinations, optical coherence tomography (OCT), and fluorescein angiography should be performed as indicated depending on the clinical findings and the judgment of the treating ophthalmologist [A:III]. Treated patients should be instructed to report symptoms of endophthalmitis and should be re-examined promptly [A:III].

**Provider**

Treatment of CNV is difficult, and referral to an ophthalmologist with special training or experience in managing this condition is appropriate.

**Counseling/Referral**

All patients with AMD should be educated about the prognosis of the disease and the potential value of treatment as appropriate for their ocular and functional status. [A:III]

Patients with early AMD who may develop the intermediate or more severe stages of AMD should be encouraged to have regular dilated eye exams for the early detection of the intermediate stage of AMD. [A:III]

Patients with intermediate AMD who are at increased risk of visual loss or of progression to advanced AMD should be educated about methods of detecting new symptoms of CNV and about the need for prompt notification to an ophthalmologist who can confirm if the new symptoms are from CNV and who can begin treatment if indicated. [A:III]

Patients with CNV for whom treatment may be indicated, based on the AMD treatment trials, should be counseled about the effects of treatment, [A:III] some of which are as follows:

- Treatment will reduce but not eliminate the risk of severe visual loss.
- Thermal laser surgery will produce permanent scotomas. The location, size, and anticipated effect of the scotoma on central visual function (e.g., reading vision) should be explained.

- Verteporfin PDT and pegaptanib sodium injection will reduce the risk of moderate and severe visual loss, but most patients will still lose some vision over 2 years, and improvement in visual acuity is unusual. The dosing regimen upon which efficacy was demonstrated in the clinical trials included PDT administration every 3 months if evidence of leakage on fluorescein angiography, and pegaptanib sodium injection every 6 weeks.
- There is a high risk of CNV persistence or recurrence after thermal laser surgery that could require additional laser surgery. This risk is greatest during the first year after initial treatment.
- Multiple fluorescein angiograms are necessary for appropriate follow-up after thermal laser surgery, verteporfin PDT, or pegaptanib sodium, ranibizumab, or bevacizumab injection.
- Multiple OCT scans may be necessary for appropriate follow-up after thermal laser surgery, verteporfin PDT, pegaptanib sodium, ranibizumab, or bevacizumab injection.

Patients with reduced visual function should be referred for vision rehabilitation and social services www.aao.org/smartsight [A:III].

**Definitions**:

**Ratings of Importance to Care Process**

Level A, defined as most important
Level B, defined as moderately important
Level C, defined as relevant but not critical

**Ratings of Strength of Evidence**

- Level I includes evidence obtained from at least one properly conducted, well-designed randomized, controlled trial. It could include meta-analyses of randomized controlled trials.
- Level II includes evidence obtained from the following:
    - Well-designed controlled trials without randomization
    - Well-designed cohort or case-control analytic studies, preferably from more than one center
    - Multiple-time series with or without the intervention
- Level III includes evidence obtained from one of the following:
    - Descriptive studies
    - Case reports
    - Reports of expert committees/organization (e.g., Preferred Practice Pattern panel consensus with peer review)

## CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

## REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for most recommendations (see "Major Recommendations" field).

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

Improved vision or minimized visual loss and functional impairment related to age-related macular degeneration (AMD)

### POTENTIAL HARMS

A brief list of complications is given below. Refer to the original guideline document for a more detailed discussion.

#### Fluorescein Angiography Testing

- Severe medical complications may occur, including death (approximately 1 in 200,000 patients)

#### Supplements of High-dose Antioxidants and Zinc

- Beta-carotene
    - Increased yellowing of the skin
    - Increased risk of developing lung cancer in current smokers or former smokers who stopped within the last year
- Zinc
    - Increased risk of hospitalizations for genitourinary causes (prostate hypertrophy in men)

#### Thermal Laser Photocoagulation Surgery

- Severe vision loss following treatment, which may be permanent
- Rupture of Bruch's membrane with subretinal or vitreous hemorrhage
- Retinal pigment epithelium (RPE) tears
- Treatment of the fovea in juxtafoveal neovascularization

#### Photodynamic Therapy (PDT)

- Severe vision loss within 1 week following treatment in 1 to 4%, which may be permanent
- Infusion site extravasation requiring coverage of the infiltrated area for 5 days or until it is normal
- Idiosyncratic back pain during infusion of drug in 1% to 2%
- Photosensitivity reaction (can be avoided by avoiding direct sunlight)

**Pegaptanib Sodium Injection**

- Endophthalmitis (1.3% of treated cases during first year of treatment)
- Traumatic injury to the lens (0.6% of treated cases during first year of treatment)
- Retinal detachment (0.7% of treated cases during first year of treatment)

**Ranibizumab Injection**

- Endophthalmitis (cumulative $\leq$1.0% over two years in the minimally classic/occult trial of the anti-VEGF antibody ranibizumab in the treatment of neovascular AMD (MARINA) study, <1.0% over one year in the Anti-VEGF antibody for the treatment of predominantly classic CNV in AMD (ANCHOR) Study.
- Retinal detachment (<0.1% of treated cases during first year of treatment)
- Traumatic injury to the lens (0.1% of treated cases during first year of treatment)

## CONTRAINDICATIONS

### CONTRAINDICATIONS

The use of verteporfin photodynamic therapy (PDT) is contraindicated in patients with porphyria or a known allergy or sensitivity to the drug, and careful consideration should be given to patients with liver dysfunction, and patients who are pregnant, breastfeeding, or of pediatric age because these patients were not studied in published reports.

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

- **Preferred Practice Patterns provide guidance for the pattern of practice, not for the care of a particular individual.** While they should generally meet the needs of most patients, they cannot possibly best meet the needs of all patients. Adherence to these Preferred Practice Patterns will not ensure a successful outcome in every situation. These practice patterns should not be deemed inclusive of all proper methods of care or exclusive of other methods of care reasonably directed at obtaining the best results. It may be necessary to approach different patients' needs in different ways. The physician must make the ultimate judgment about the propriety of the care of a particular patient in light of all of the circumstances presented by that patient. The American Academy of Ophthalmology is available to assist members in resolving ethical dilemmas that arise in the course of ophthalmic practice.
- **Preferred Practice Patterns are not medical standards to be adhered to in all individual situations.** The Academy specifically disclaims any and all liability for injury or other damages of any kind, from negligence or otherwise, for any and all claims that may arise out of the use of any recommendations or other information contained herein.

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## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

### IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads
Quick Reference Guides/Physician Guides

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Living with Illness

### IOM DOMAIN

Effectiveness
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

American Academy of Ophthalmology (AAO). Age-related macular degenration. Preferred practice pattern. San Francisco (CA): American Academy of Ophthalmology (AAO); 2006. 33 p. [134 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

1998 Sep (revised 2006 Sep)

## GUIDELINE DEVELOPER(S)

American Academy of Ophthalmology - Medical Specialty Society

## SOURCE(S) OF FUNDING

American Academy of Ophthalmology

## GUIDELINE COMMITTEE

Retina Panel; Preferred Practice Patterns Committee

## COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

*Retina Panel Members*: Emily Y. Chew, MD (*Chair*) Macula Society and Retina Society Representative; William E. Benson, MD; H. Culver Boldt, MD; Tom S. Chang, MD; Louis A. Lobes, Jr., MD; Joan W. Miller, MD; Timothy G. Murray, MD, American Society of Retina Specialists Representative; Marco A. Zarbin, MD, PhD; Leslie Hyman, PhD, Methodologist

*Preferred Practice Patterns Committee Members*: Sid Mandelbaum, MD (*Chair*); Emily Y. Chew, MD; Linda M. Christmann, MD; Douglas E. Gaasterland, MD; Samuel Masket, MD; Stephen D. McLeod, MD; Christopher J. Rapuano, MD; Donald S. Fong, MD, MPH, Methodologist

*Academy Staff*: Nancy Collins, RN, MPH; Flora C. Lum, MD; Doris Mizuiri

## FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

These authors have disclosed the following financial relationships occurring from January 2005 to August 2006:

H. Culver Boldt, MD: Alcon – Affiliation.

Tom S. Chang, MD: Genentech, Novartis Ophthalmics – Consultant/Advisor.

Joan W. Miller, MD: Alnylam Pharmaceuticals – Affiliation. Bausch and Lomb, Genentech – Consultant/Advisor. QLT Phototherapeutics – Patents/Royalty. Additional Disclosure: The Massachusetts Eye and Ear Infirmary has an ownership in three U.S. patents directed to the use of verteporfin. In addition, the Massachusetts Eye and Ear Infirmary has an ownership interest in certain patent applications directed to the selective destruction of subretinal choroidal neovasculature for the treatment of macular degeneration and other disorders. Should the Massachusetts Eye and Ear Infirmary receive royalties or other financial remuneration as a result of these patents and patent applications, Dr. Miller would receive a share of the same in accordance with the Massachusetts Eye and Ear Infirmary's institutional Patent Policy and Procedures, which includes royalty-sharing provisions.

Marco A. Zarbin, MD, PhD: Advanced Cell Technology, Celgene, Genentech, Novartis Ophthalmics – Consultant/Advisor. Johnson & Johnson Medical – Consultant/Advisor. Grant support.

## GUIDELINE STATUS

This is the current release of the guideline.

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## GUIDELINE AVAILABILITY

Electronic copies: Available from the American Academy of Ophthalmology (AAO) Web site.

Print copies: Available from American Academy of Ophthalmology, P.O. Box 7424, San Francisco, CA 94120-7424; telephone, (415) 561-8540.

## AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Summary benchmarks for preferred practice patterns. San Francisco (CA): American Academy of Ophthalmology; 2006 Nov. 21 p.

Available in Portable Document Format (PDF) from the American Academy of Ophthalmology (AAO) Web site.

Print copies: Available from American Academy of Ophthalmology, P.O. Box 7424, San Francisco, CA 94120-7424; telephone, (415) 561-8540.

## PATIENT RESOURCES

None available

## NGC STATUS

This summary was completed by ECRI on February 20, 1999. The information was verified by the guideline developer on April 23, 1999. This summary was updated on January 08, 2002. The updated information was verified by the guideline developer as of February 19, 2002. This summary was updated again on April 30, 2004. The information was verified by the guideline developer May 20, 2004. This NGC summary was updated by ECRI on January 5, 2006. The updated information

was verified by the guideline developer on February 9, 2006. This summary was updated by ECRI on April 12, 2006 following the U.S. Food and Drug Administration (FDA) advisory on Macugen (pegaptanib sodium injection). This summary was updated on January 5, 2007. The updated information was verified by the guideline developer on January 30, 2007.

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Date Modified: 9/22/2008


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